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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/046,914	01/17/2002	Yakov Sidorin	4090-3	3385
23117	7590	12/08/2003	EXAMINER	
NIXON & VANDERHYTE, PC 1100 N GLEBE ROAD 8TH FLOOR ARLINGTON, VA 22201-4714			FLORES RUIZ, DELMA R	
			ART UNIT	PAPER NUMBER
			2828	

DATE MAILED: 12/08/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Applicati n No.

10/046,914

Applicant(s)

SIDORIN, YAKOV

Examiner

Delma R. Flores Ruiz

Art Unit

2828

--The MAILING DATE of this communication appears on th cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.


- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 17 January 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 26 - 60 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 26 - 60 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

  
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TECHNOLOGY CENTER 2800

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 1/17/2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4 and 7. 6) ☐ Other:

## **DETAILED ACTION**

### ***Drawings***

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the controlling optical must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance. The correction is required.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 26 –28, 33 – 51 and 58 are rejected under 35 U.S.C. 102(b) as being anticipated by Furuyama et al (5, 434,426).

**Regarding claims 26, 43 and 44** Furuyama discloses a tunable optical device comprising; a zone plate device (see Fig. 3B, Character 111) for delivering optical radiation a predetermined location, the zone plate device providing a non-rectilinear diffraction grating which diffract incident radiation onto an optical axis through the device (Column 11, Lines 45 – 60); and control means for controlling optical performance of the zone plate device wherein said control means comprises means to change the refractive index of material of the zone plate device so as to change on or more characteristics of the optical radiation delivered at said predetermined location and the zone plate device provides at least part of an external cavity in relation to the laser diode and the external cavity is entirely provided in material other than air ((See Figs. 3A, 4, 5A, 6B and 8A-FColumn 17, Lines 20 – 39 and 48 – 59, Column 20, Lines 15 – 18, Column 22, Lines 1 – 14, Column 24, Lines 14 – 47, Column 25, Lines 42 – 49 and Column 27, Lines 18 – 22).

**Regarding claims 27 and 39,** Furuyama discloses a tunable optical device, wherein the control means comprises means to apply an electric field to said material of the zone plate device and zone plate device for delivering optical radiation, at a predetermined location, wherein the method comprises the step of applying an electric

field to material of the zone plate device so as to change its optical performance whereby the intensity of the optical radiation at the predetermined location so changed (Column 6, Lines 63 – 68 and Column 7, Lines 1 – 2).

**Regarding claim 28**, Furuyama discloses a material of the zone plate device is electro-optic (said limitation only recites facts and features that are well known and expected, the same features that essentially result from the use or application of a material of the zone plate device is electro-optic, and therefore said limitations are said to be inherently disclosed in the teachings of Furuyama).

**Regarding claim 33**, Furuyama discloses a control means comprises electrodes (see Fig. 3B, Characters 104, 105 and 109) extending from the first facet to the second facet for creating an electric field in the piece of material.

**Regarding claim 34**, Furuyama discloses a zone plate device provides amplitude zone plate elements (see Figs. 1B, 4, 5A and 6B).

**Regarding claim 35**, Furuyama discloses a zone plate device provides phase zone plate elements (said limitation only recites facts and features that are well known and expected, the same features that essentially result from the use or application of a

zone plate device provides phase zone plate elements, and therefore said limitations are said to be inherently disclosed in the teachings of Furuyama).

**Regarding claim 36**, Furuyama discloses a laser diode (see Fig. 3B) optically coupled to a zone plate device for providing wavelength selective optical feedback to the laser diode, wherein the method comprises the step of applying an electric field to material of the zone plate device so as to change its optical performance (see Figs. 1B, 4, 5A and 6B, Column 17, Lines 20 – 39 and 48 – 59, Column 20, Lines 15 – 18, Column 22, Lines 1 – 14, Column 24, Lines 14 – 47, Column 25, Lines 42 – 49 and Column 27, Lines 18 – 22).

**Regarding claim 37**, Furuyama discloses the step of applying an electric field to material of the zone plate device changes its optical performance so as to change the wavelength at which the zone plate device forms an image in a predetermined image plane (see Figs. 1B, 4, 5A and 6B, Column 17, Lines 20 – 39 and 48 – 59, Column 20, Lines 15 – 18, Column 22, Lines 1 – 14, Column 24, Lines 14 – 47, Column 25, Lines 42 – 49 and Column 27, Lines 18 – 22).

**Regarding claim 38**, Furuyama discloses zone plate device for frequency filtering of optical radiation so as to deliver radiation of a selected frequency at a predetermined location, wherein the method comprises the step of applying an electric

field to material of the zone plate device so as to change its optical performance whereby the frequency selected for delivery at the predetermined location is changed (see Figs. 1B, 4, 5A, 6B, and 8A-F, Column 17, Lines 20 – 39 and 48 – 59, Column 20, Lines 15 – 18, Column 22, Lines 1 – 14, Column 24, Lines 14 – 47, Column 25, Lines 42 – 49 and Column 27, Lines 1 8 – 22).

**Regarding claims 40 and 41**, Furuyama discloses a control means comprises means to change the refractive index of material of the zone plate device so as the change the wavelength and intensity of optical radiation at said predetermined location (see Figs. 1B, 4, 5A and 6B, Column 17, Lines 20 – 39 and 48 – 59, Column 20, Lines 15 – 18, Column 22, Lines 1 – 14, Column 24, Lines 14 – 47, Column 25, Lines 42 – 49 and Column 27, Lines 1 8 – 22).

**Regarding claim 42**, Furuyama discloses a semiconductor laser diode and a feedback section for providing wavelength selective feedback to the laser diode wherein the feedback section comprises the zone plate device (said limitation only recites facts and features that are well known and expected, the same features that essentially result from the use or application of a semiconductor laser diode and a feedback section for providing wavelength selective feedback to the laser diode wherein the feedback section comprises the zone plate device, and therefore said limitations are said to be inherently disclosed in the teachings of Furuyama).

**Regarding claim 45,** Furuyama discloses a zone plate device comprises a piece of material, optically transparent over a range of wavelength (said limitation only recites facts and features that are well known and expected, the same features that essentially result from the use or application of a zone plate device comprises a piece of material, optically transparent over a range of wavelength, and therefore said limitations are said to be inherently disclosed in the teachings of Furuyama) which, in use, is optically coupled to a facet of the laser diode<sup>3</sup> and transmits optical radiation from the diode to the non-rectilinear diffraction grating (see Fig. 3B Character 111).

**Regarding claims 46 and 47,** Furuyama discloses a non-rectilinear diffraction grating is constructed as variation in refractive index in material of the zone plate device and the non-rectilinear diffraction grating is arranged to image incident radiation, the radiation having a selected wavelength, onto a predetermined image plane (see Figs. 1B, 4, 5A and 6B, Column 17, Lines 20 – 39 and 48 – 59, Column 20, Lines 15 – 18, Column 22, Lines 1 – 14, Column 24, Lines 14 – 47, Column 25, Lines 42 – 49 and Column 27, Lines 18 – 22).

**Regarding claim 48 and 49,** Furuyama discloses a the incident radiation is received from an object plane and the object and image planes are coincident and the zone plate device is arranged in fixed relation to the image plane (said limitation only



recites facts and features that are well known and expected, the same features that essentially result from the use or application of a the incident radiation is received from an object plane and the object and image planes are coincident and the zone plate device is arranged in fixed relation to the image plane, and therefore said limitations are said to be inherently disclosed in the teachings of Furuyama).

**Regarding claims 50 and 51**, Furuyama discloses a image plane is coincident with a surface of the zone plate device and the non-rectilinear diffraction grating is rotationally symmetric (said limitation only recites facts and features that are well known and expected, the same features that essentially result from the use or application of a image plane is coincident with a surface of the zone plate device and the non-rectilinear diffraction grating is rotationally symmetric, and therefore said limitations are said to be inherently disclosed in the teachings of Furuyama.

**Regarding claim 58**, Furuyama discloses a zone plate device is optically coupled directly to a facet of the laser diode (see Fig. 3).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 29 – 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Furuyama et al (5, 434,426) in view of Deacon et al (US RE37,809 E).

**Regarding claim 29 – 31**, Furuyama discloses the claimed invention except for zone plate device comprises strontium barium niobate (SBN:75) and the zone plate device comprises a piece of said material , the piece of material having zone plate elements on a first facet thereof and said predetermined location coinciding with a second facet thereof. It would have been obvious at the time of applicant's invention, to combine Deacon of teaching a zone plate device comprises strontium barium niobate (SBN:75) and the zone plate device comprises a piece of said material , the piece of material having zone plate elements on a first facet thereof and said predetermined location coinciding with a second facet thereof with tunable optical device because it would have been obvious to one having ordinary skill in the art at the time the invention was made to zone plate device comprises strontium barium niobate (SBN:75) and the zone plate device comprises a piece of said material , the piece of material having zone plate elements on a first facet thereof and said predetermined location coinciding with a second facet thereof, since it has been held to be within the general skill of a worker in

the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. In re Leshin, 125 USPQ 416.

**Regarding claim 32**, Furuyama discloses the claimed invention except for zone plate device from the first facet to the second facet is at least 200 microns. It would have been obvious at the time of applicant's invention, to combine Deacon of teaching a zone plate device from the first facet to the second facet is at least 200 microns with tunable optical device because It would have been obvious to one of ordinary skill in the art at the time the invention was made to zone plate device from the first facet to the second facet is at least 200 microns, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

Claims 53 – 57 and 59 – 60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Furuyama et al (5, 434,426) in view of Faris et al (5,680,233).

**Regarding claim 52 – 57, and 59 – 60**, Furuyama discloses the claimed invention except for mode hop control device. It would have been obvious at the time of applicant's invention, to combine Faris of teaching a mode hop control device with

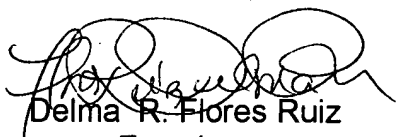
tunable optical device because the mode hop control use to control to patter of motion in a variation device.

**Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Delma R. Flores Ruiz whose telephone number is (703) 308-6238. The examiner can normally be reached on M - F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Ip can be reached on (703) 308-3098. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 306-3431.



Delma R. Flores Ruiz  
Examiner  
Art Unit 2828  
DRFR/PI  
October 10, 2003



Paul Ip  
Supervisor Patent Examiner  
Art Unit 2828